

WHAT IS CLAIMED IS

1. A read/write arrangement comprising:
 - a cantilever disposed with a medium which is movable relative to the cantilever;
 - a device associated with one of the cantilever and the medium which is configured to be responsive to changes in electrical field between the medium and the cantilever caused by a change in distance between the medium and the cantilever;
 - a heater disposed on the cantilever for heating the medium and for inducing localized topographical changes which represent bits of data; and
 - a circuit which electrically interconnects both of the device and the heater.
2. A read/write arrangement as set forth in claim 1, wherein the circuit forms at least a part of one of the device.
3. A read/write arrangement as set forth in claim 1, wherein the circuit has portions which are common to both the device and the heater.
4. A read/write arrangement as set forth in claim 1, wherein the cantilever comprises a probe which extends from the cantilever and which is configured to be contactable with a surface of the medium and to respond to a topography of the medium to cause the distance between the cantilever and the medium to vary.
5. A read/write arrangement as set forth in claim 1, wherein the medium is electrically non-conductive and is supported on an electrically conductive substrate.
6. A read/write arrangement as set forth in claim 1, wherein the device is a FET (Field Effect Transistor).

7. A read/write arrangement as set forth in claim 6, wherein the circuit comprises a plurality of electrically conductive traces which are formed in the cantilever and which comprise a source and a drain of the FET and wherein the source or drain of the FET forms part of a circuit which supplies electrical current to the heater.
8. A read/write arrangement as set forth in claim 7, wherein the plurality of electrically conductive traces further comprise a channel interposed between the source and the drain of the FET.
9. A read/write arrangement as set forth in claim 7, wherein the cantilever is made of silicon and the electrically conductive traces are formed by doping the silicon to render selected regions electrically conductive.
10. A read/write arrangement as set forth in claim 7, wherein the heater comprises a doped region having an electrical resistance which is higher than the traces.
11. A read/write arrangement as set forth in claim 9, wherein the cantilever has a pair of arms which are interconnected by a bridge member, wherein the probe is formed on the bridge member, wherein the heater is formed on the bridge member and wherein the doped traces are formed on both arms.
12. A read/write arrangement as set forth in claim 6, wherein the FET is configured to function as the heater.
13. A read/write arrangement as set forth in claim 6, wherein the device is an induced channel FET (Field Effect Transistor).
14. A read/write arrangement as set forth in claim 3, wherein the medium is electrically non-conductive and is supported on a substrate which is electrically conductive, and wherein the substrate is configured to be circuited with the FET

so that variations in the electrical field which result from a change in distance between the medium and the cantilever, induces a change in electrical current passing through the FET and produces a read signal.

15. A read/write arrangement as set forth in claim 11, wherein the bridge member interconnects the outboard ends of the cantilever and further comprises a second bridge which is located inboard of the first said bridge and on which the FET is formed.

16. A read/write arrangement as set forth in claim 15, wherein the FET comprises a plurality of source portions and a plurality of drain portions which are interleaved with the plurality of source portions.

17. A read/write arrangement as set forth in claim 16, further comprising a plurality of channel portions which each disposed between a source portion and a drain portion.

18. A read/write arrangement for a contact probe atomic resolution storage system, comprising:

- a cantilever disposed with an electrically non-conductive medium which is movable relative to the cantilever, the cantilever having a probe which is configured to follow a topography of the medium;

- a device formed in the cantilever which responds to a change in electric field induced by a change in distance between the cantilever and a substrate on which the medium is supported; and

- a heater disposed in the cantilever and circuited with the device.

19. A read/write mechanism as set forth in claim 18, wherein the device is a FET (Field Effect Transistor).

20. A read/write mechanism as set forth in claim 19, wherein the FET has source and drain portions formed in the cantilever and wherein the heater is

formed in the cantilever and circuited with the source and drain portions of the FET.

21. A read/write mechanism as set forth in claim 19, wherein the device is an induced channel FET.

22. A read/write mechanism as set forth in claim 19, wherein the cantilever is formed of silicon and the heater comprises a doped portion which is electrically connected with doped regions that form a source and a drain of the FET.

23. A method of making a read/write arrangement comprising:
forming a FET in a silicon cantilever by doping electrically conductive source and drain regions in a selected surface of the cantilever, the FET being configured to be gated by an electric field which is generated by applying a bias to a substrate separate from the cantilever;
forming a probe on the selected surface of the cantilever; and
forming a heater in the cantilever proximate the probe.

24. A method as set forth in claim 23, further comprising:
forming the cantilever to have arms and an end bridge portion which interconnects terminal outboard ends of the arms; and
forming the probe and the heater on the end bridge portion.

25. A method as set forth in claim 24, further comprising configuring the FET to function as the heater.

26. A method as set forth in claim 24, further comprising forming the source and drain regions of the FET in the arms of the arms of the cantilever.

27. A method as set forth in claim 24, further comprising:
forming a second bridge between the arms of the cantilever; and

forming the source and drain portions of the FET on the second bridge portion.

28. A method as set forth in claim 24 comprising:
forming a first drain region of the FET on a first arm of the cantilever;
forming a first source region of the FET on a first arm of the cantilever;
forming a second drain region of the FET on a second arm of the cantilever;
forming a second source region of the FET on a second arm of the cantilever; and
forming a doped region on the end bridge portion which forms the heater so as to be electrically connected with one of the first and second source regions, and the first and second drain regions.
29. A method as set forth in claim 28, further comprising forming first and second channel portions on the first and second arms respectively.
30. A method as set forth in claim 28, further comprising forming the first and second drain regions to have a common portion which spans the end bridge portion.
31. A read/write arrangement comprising:
FET means formed in a silicon cantilever by doping electrically conductive source and drain regions in a selected surface of the cantilever, for being gated by an electric field which is generated by applying a bias to a substrate separate from the cantilever;
a probe on the selected surface of the cantilever; and
heater means in the cantilever proximate the probe for heating and forming a data bit indicative topography in a medium to be engaged by the probe.
32. A read/write arrangement as set forth in claim 31, wherein the cantilever has arms and an end bridge portion which interconnects terminal outboard ends

of the arms, and wherein the probe and the heater are formed on the end bridge portion.

33. A read/write arrangement as set forth in claim 31, wherein the FET means is configured to function as the heater.

34. A read/write arrangement as set forth in claim 31, wherein the source and drain regions are formed in the arms of the arms of the cantilever.

35. A read/write arrangement as set forth in claim 31, wherein the cantilever further comprises a second bridge between the arms of the cantilever and wherein source and drain portions of the FET are formed on the second bridge portion.

36. A read/write arrangement as set forth in claim 31, wherein:
a first drain region of the FET is formed on a first arm of the cantilever;
a first source region of the FET is formed on a first arm of the cantilever;
a second drain region of the FET is formed on a second arm of the cantilever;
a second source region of the FET is formed on a second arm of the cantilever; and
a doped region on the end bridge portion which forms the heater, is electrically connected with one of the first and second source regions and the first and second drain regions.

37. A read/write arrangement as set forth in claim 36, wherein first and second channel portions are formed on the first and second arms respectively.

38. A read/write arrangement as set forth in claim 36, wherein the first and second drain regions are formed to have a common portion which spans the end bridge portion.